UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,499	02/20/2004	George Gustave Zipfel JR.	Zipfel 1	7599

7590 01/11/2005

Ronald D. Slusky
353 West 56th St.-Suite 5L
New York,, NY 10019-3775

EXAMINER	
SHINGLETON, MICHAEL B	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/783,499	ZIPFEL ET AL.	
	Examiner	Art Unit	
	Michael B. Shingleton	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-78* is/are pending in the application. 52-58 and 74

4a) Of the above claim(s) 12, 18, 27-29, 40, 47, 48, ____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11, 13-17, 19-26, 30-39, 41-46, 49-51, 59-73 and 75-78 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2/20/2004
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Election/Restrictions

Applicant's election with traverse of Group I in the reply filed on 1-18-2004 is acknowledged. The traversal is on the ground(s) that applicant believes that claim 9, 34, 43, 52, 59, and 70 are generic. This is not found persuasive because claim 52 and those dependent thereon recites that be no phase relationship between baseband components whilst the elected invention requires that there must be a phase relationship between the two baseband components i.e. one is the inverse of the other. Thus claim 52 and those dependent thereon are not drawn to the elected invention and accordingly cannot be considered generic. Claim 9 requires that "the baseband components of the at least first and second switching signals being such that, and said loads being interconnected in such a way that, substantially all of the current at baseband frequencies flowing out of one or more of said loads at a given time flows into one or more of the others of said loads" which as applicant points outs corresponds to the invention where at least one baseband frequency has a particular phase relationship to another, i.e. PWM uses baseband component B whereas PWM' uses the inverse baseband component of B. Thus claim 9 is considered drawn to the elected invention but cannot be considered generic because there must be a phase relationship. Claim 34 like claim 9 contains the paragraph 0049 material as recognized by applicant. Thus claim 34 is considered to be drawn to the elected invention but cannot be considered generic because there must be a phase relationship between components. Note that claim 55 is dependent on claim 54 which applicant admits is non-elected. Thus claim 55 is not drawn to the elected invention. Claim 40 recites more than three circuits paths "$N \geq 3$". Thus claim 40 is not drawn to the elected invention of only two circuit paths. The examiner agrees that claims 43, 59 and 70 are generic.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11, 13-17, 19-26, 30-39, 41-46, 49-51, 59-73, and 75-78 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject

matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The conclusion of $[i_{L1}(t) + i_{L2}(t)] \approx 0$ as presented at the top of page 13 of the specification that is representative of the claimed invention, i.e. "the sum of the values of that particular signal variable is substantially constant" or "the baseband components of the at least first and second switching signals being such that, and said loads being interconnected in such a way that, substantially all of the current at baseband frequencies flowing out of one or more of said loads at a given time flows into one or more of the others of said loads" etc. is not supported by the drawings or the description of these drawings as alleged by applicant. Note that in applicant's traversal of the restriction requirement dated 10-18-2004 applicant equates claimed limitations like "the baseband components of the at least first and second switching signals being such that, and said loads being interconnected in such a way that, substantially all of the current at baseband frequencies flowing out of one or more of said loads at a given time flows into one or more of the others of said loads" to that of paragraph [0049] i.e. page 13 of the specification. Page 11 of the specification recites "...when signal PWM is high, lead 33a is (approximately) 10 volts positive with respect to lead 33b, causing FET 35 to be ON and FET 47 to be OFF. A current path is thus established from power supply 31 (supplying a voltage V_2) through FET 35, inductor 39, common-mode inductor 41, load L1 and into power supply 32 (supplying a voltage V_1) and current $I_{L1}(t)$ flows through load L1." Page 12 recites "FETs 35 and 37 are switched in synchrony", which is clearly represented by Figures 3A and 3B, and "gate driver 45, which operates FETs 37 and 55 in substantially the same manner that gate driver 33 operates the half-bridge comprising FETs 35 and 47." Thus when signal PWM' is high, the unmarked gate lead directly connected to transistor 37 is (approximately) 10 volts positive with respect to the unmarked gate lead directly connected to transistor 55, causing FET 37 to be ON and FET 55 to be OFF. A current path is thus established from power supply 31 (supplying a voltage V_2) through FET 37, inductor 43, common-mode inductor 41, load L2 and into power supply 32 (supplying a voltage V_1) and current $I_{L2}(t)$ flows through load L2. Thus at the time when the PWM and PWM' signals are both high the current $[i_{L1}(t) + i_{L2}(t)]$ is not approximately zero in accordance with applicant's specification and drawings. Note the sign convention of these two currents as shown in Figures like 4A. Applicant's basis of the invention "[a]s a consequence of the fact that the baseband signal used to generate signal PWM' is an inverted version of the baseband signal used to generate PWM, the baseband current flowing through load L1 is the inverse of—that is, flows in the opposite direction from—the baseband current flowing through load L2. Loads L1 and L2 are thus driven in a push-pull fashion. That is, as baseband current flows through load L1, a substantially equal amount of baseband current flows in the opposite direction

through load L2." is not enabled in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention without undue experimentation. In fact the invention described and shown by applicant in particular note pages 11 and 12 of the specification, appears to be a description of the exact opposite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims1-7, 9-11,13-17, 19, 21-26, 30-39, 41, 43, 44, 46, 49-51, 59-61, 63-68, 70-73 and 75-78 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tokumo et al. 4,968,948 (Tokumo).

The following prior art rejection is made based on the similarity of the claimed structural limitations and the prior art reference in an attempt to further the prosecution of the instant application. Figures 1, 2A, 2B, 2C, and 2D along with the relevant text discloses the claimed switching amplifier arrangement having the two claimed switching elements 5 and 5' that compare to elements like 35 and 47, and 37 and 55 of the disclosed invention, the two claimed series inductors 14 and 15 that equate to elements 39 and 43 of the disclosed invention, the claimed common-mode inductor 11 that is the same structure as applicant's element 41 of the disclosed invention and the capacitors 7 and 7' that form the two loads of the claimed invention and equate to elements L1 and L2 of the disclosed invention. Note these capacitors are considered loads for they are connected in the same manner as applicant's capacitive loads L1 and L2. Note that capacitor 7 is connected to one leg of the common-mode inductor 11 just like L1 is connected to the one leg of the common-mode inductor 41 and the other end of the capacitor 7 is connected to a potential that is less than V_{cc} just like the other end of L1 is connected to a potential V_1 that is less than V_2. Similarly, capacitor 7' is connected in the same manner as that of L2 of the instant application and thus is considered every much a load as applicant's invention. Note that even the outputs of the switching elements 5 and 5' form the same "alignment" as the outputs of the switching elements 35 and 47, and 37 and 55 of the claimed invention. Namely the waveforms are aligned such that at the peak of the triangle waveform and the highs of the two pwm waveforms line up. Note Figures 2A, 2C, and 2D of Tokumo. This equates to the waveforms of 3A and 3B of the disclosed invention. Column 3,

beginning with line 10 thereof clearly recites that the common-mode inductor has the function of filtering out the carrier, what applicant calls the "switching band components". Also in particular column 3, around line 25 of Tokumo recites that this common-mode inductor can be made smaller because of its arrangement caused by the "little possibility of magnetic saturation". This is the same objective of "minimizing core flux and consequently core size" as recited by applicant (See paragraph [0063]) of the specification. Therefore, because the structure of Tokumo is the same as that claimed, has the same waveforms powering/controlling the device and exactly equates to the basic arrangement of the disclosed invention shown in Figures 4A and 4B, all the recited functions like are inherent in the structure of Tokumo. Note that element 9 of Tokumo being that it is a speaker inherently performs a filter function and is a mechanical load. Note that V_2 is equal to $+V_{cc}$ and V_1 is equal to ground and V_G is equal to $-V_{cc}$ in Tokumo and thus the equation $V_2 > V_1 > V_G$ is clearly satisfied.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 8, 20, 42, 45, 62 and 69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tokumo et al. 4,968,948 (Tokumo).

The same reasoning as applied above in the 35 USC 103 rejection and the following: Claims 8, 20, 42, 45, 62, and 69 all recite "a mechanical load connected to at least one of said reactive loads" and that the mechanical load includes means for generating acoustic sonar signals.

Tokumo is silent on the details of the speaker. A sonar-transmitting element is a well-known speaker element for use underwater. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have replaced the speaker element of Tokumo with one that transmits under water i.e. a sonar transmitting element because, as the Tokumo reference is silent on the exact speaker utilized one of ordinary skill in the art would

have been motivated to use any art-recognized equivalent speaker element such as the conventional underwater speaker, i.e. sonar transmitting element.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571)272-1770. The examiner can normally be reached on Tues-Fri from 8:30 to 4:30. The examiner can also be reached on alternate Fridays. The examiner normally has second Mondays of the bi-week off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
December 25, 2004

Michael B Shingleton
Primary Examiner
GROUP ART UNIT 2817